

(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
BIN WEI et al.) Group Art Unit 1797
) Confirmation No. 2878
Serial No. 10/708,879)
) Examiner R. Popovics
Filed: March 30, 2004)
)
For: FLUSHING AND FILTERING SYSTEM)
FOR ELECTROEROSION MACHINING) Attorney Docket 129545-1

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), this brief is filed within two months of the Notice of Appeal filed in this case on February 5, 2008, and is in furtherance of said Notice of Appeal.

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This Appeal Brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.02:

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I. REAL PARTY IN INTEREST

The real party in interest for this Appeal is:

General Electric Company by way of an Assignment recorded at Reel/Frame
014459/0467 on March 30, 2004.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 22 Claims pending in application.

B. Current Status of Claims

1. Claims canceled: 2 and 14.
2. Claims withdrawn from consideration but not canceled: None.
3. Claims pending: 1, 3-13 and 15-24.
4. Claims allowed: None.
5. Claims rejected: 1, 3-13 and 15-24.

C. Claims On Appeal

The Claims on Appeal are Claims 1, 3-13 and 15-24.

IV. STATUS OF AMENDMENTS

No amendments to the Claims were filed subsequent to the final Office action dated December 10, 2007. The status of the amendments to the Claims prior to the final Office action is as follows:

- A. Responsive to a Restriction Requirement dated June 28, 2006, Appellant provisionally elected Species 2, corresponding to Figure 2, Claims 1-24 on July 17, 2006.
- B. Responsive to a non-final Office action dated October 4, 2006, Appellant amended Claims 1, 3, 5, 6, 13, 15, 17 and 18, and canceled Claims 2 and 14 on December 29, 2006.
- C. Responsive to a final Office action dated March 22, 2007, Appellant filed a Request For Continued Examination and amended Claims 1 and 13 on May 9, 2007.
- D. Responsive to a non-final Office action dated June 27, 2007, Appellant amended Claim 15.
- E. Responsive to a final Office action dated December 10, 2007, Appellant timely filed a Notice of Appeal on February 5, 2008.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 is directed to a flushing and filtering system (100) for an electroerosion machine. The system comprises a work tank (102) configured to maintain a workpiece (104) therein; a first filtering stage (116) for roughly filtering residue-containing machining liquid (110) exiting from said work tank (102); a second filtering stage (124) for finely filtering roughly-filtered machining liquid (110) exiting from said first filtering stage (116); a first fluid return path (130) to said work tank (102), said first fluid return path (130) comprising a high-pressure return path for introducing finely-filtered machining fluid through an electrode (106) included in the electroerosion machine; and a second fluid return path (136) to said work tank (102), said second fluid return path (136) introducing said finely-filtered machining fluid (110) through a liquid adding inlet (112) directly connected to said work tank (102). *See Figure 1; Paragraphs [0011]-[0014].*

Independent Claim 13 is directed to a method for flushing and filtering an electroerosion machine, comprising:

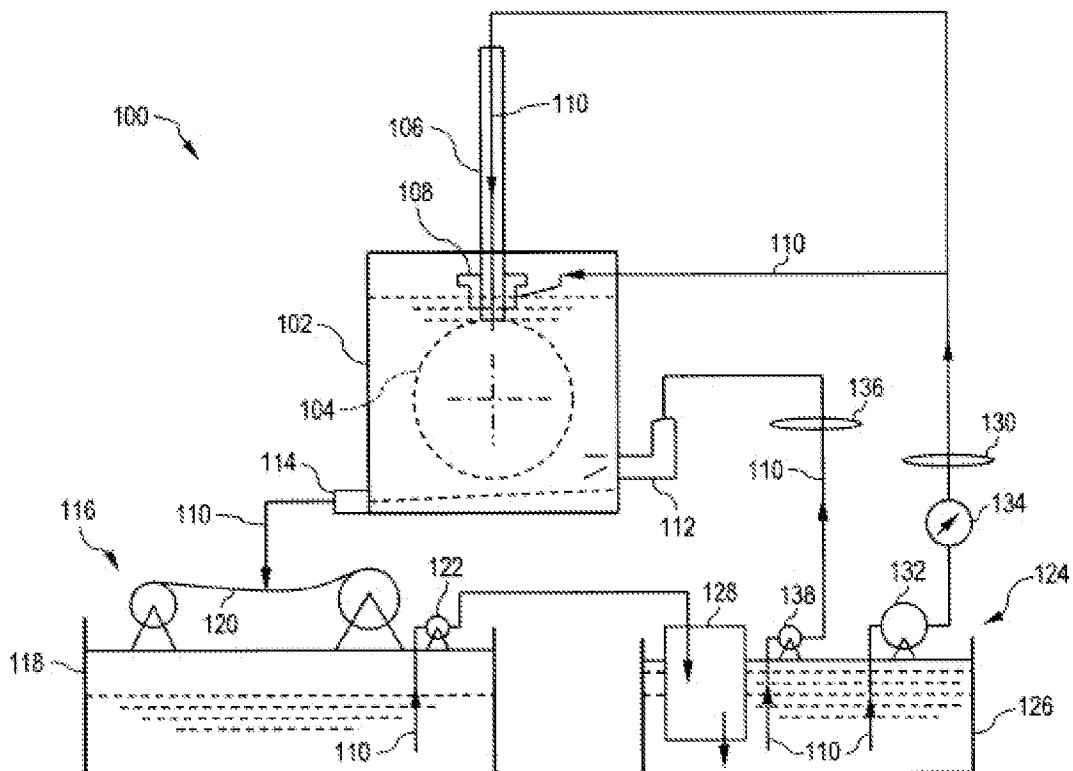
passing a residue-containing machining liquid (110) through a first filtering stage (116) for roughly filtering said residue-containing machining liquid, said residue-containing liquid exiting from a work tank (102) configured to maintain a workpiece (104) therein;

passing roughly-filtered machining liquid exiting from said first filtering stage (116) into a second filtering stage (124) for fine filtering of said roughly-filtered machining liquid (110);

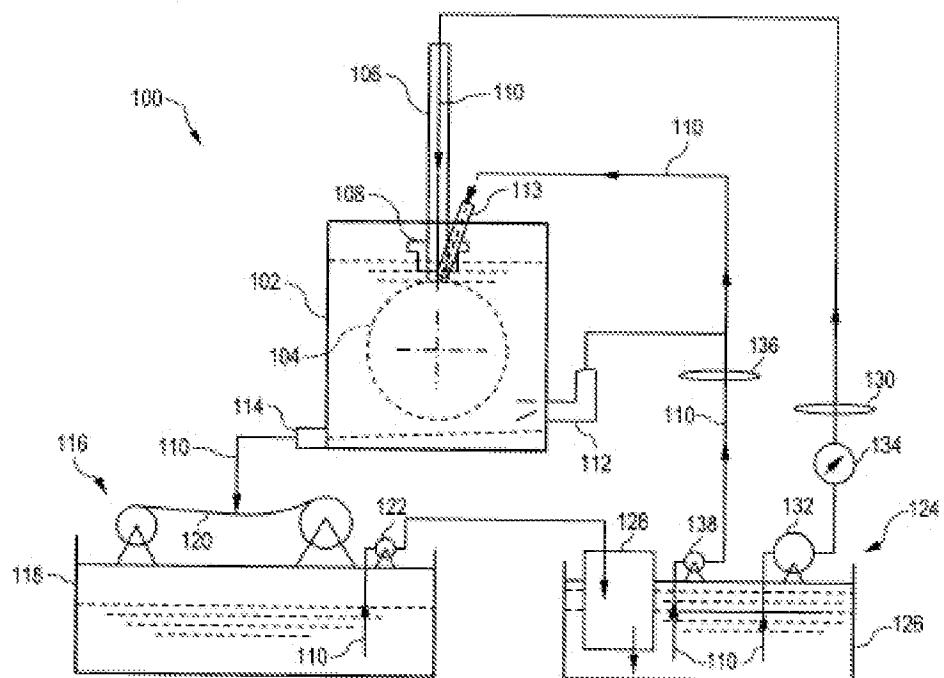
returning finely-filtered machining fluid (110) to said work tank (102) through a first fluid return path (130), said first fluid return path comprising a high-pressure return path for introducing said finely-filtered machining fluid (110) through an electrode (106) included in the electroerosion machine; and

returning said finely-filtered machining fluid (110) to said work tank (102) through a second fluid return path (136), said second fluid return path introducing said finely-filtered machining fluid through a liquid adding inlet (112) directly connected to said work tank (102). *See Figure 1; Paragraphs [0011]-[0015].*

FIG. 1



In addition to being circulated through the electrode center, the machining liquid 110 is also supplied to the guide bush for exterior flushing of contaminants. A liquid adding inlet 112 at the lower portion of the work tank 102 receives machining liquid 110 from a separate input path from that supplying the electrode 106 and guide bush 108, as described in greater detail hereinafter. Sufficient machining liquid 110 is introduced into the work tank 102 to as to maintain the workpiece 104 and guide bush 108 in a substantially submerged condition during the machining process. In an alternative embodiment depicted in Figure 2, a liquid adding outlet/nozzle 113 is configured proximate the top of the work tank 102 for receiving machining liquid 110 and spraying or flushing the machining liquid 110 to the machining area from an up-down or side-to-side direction between the workpiece 104 and electrode 106. In other words, in lieu of being submerged in machining liquid 110, the nozzle may be used to spray the exterior of the guide bush 108 and the workpiece 104. *See Figure 2; Paragraph [0012].*

FIG. 2

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether Claims 1, 3-13 and 15-24 are unpatentable under 35 U.S.C. 103(a) over Suzuki (U.S. Patent No. 5,221,467, hereinafter “Suzuki”) in view of Corcelle (U.S. Patent No. 5,071,567).
2. Whether Claims 1, 3-13 and 15-24 are unpatentable under 35 U.S.C. 103(a) over Suzuki in view of Hosaka, and further in view of Corcelle (U.S. Patent No. 5,071,567).

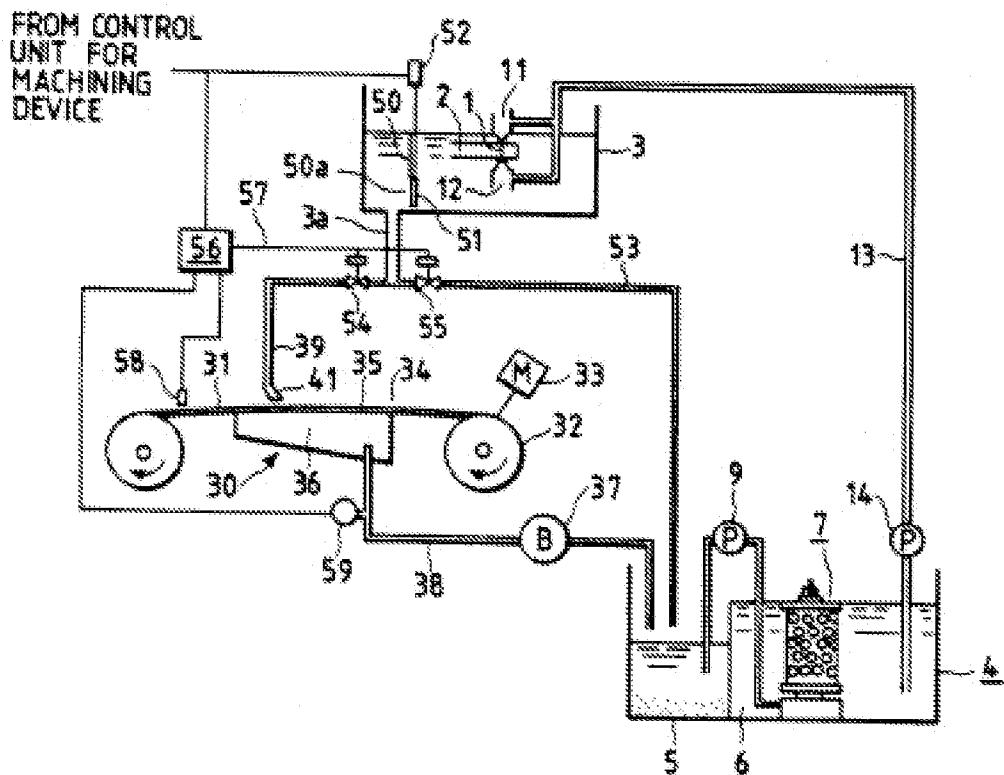
VII. ARGUMENT

1. Rejection of Claims 1, 3-13 and 15-24 under 35 U.S.C. §103(a) over Suzuki in view of Corcelle

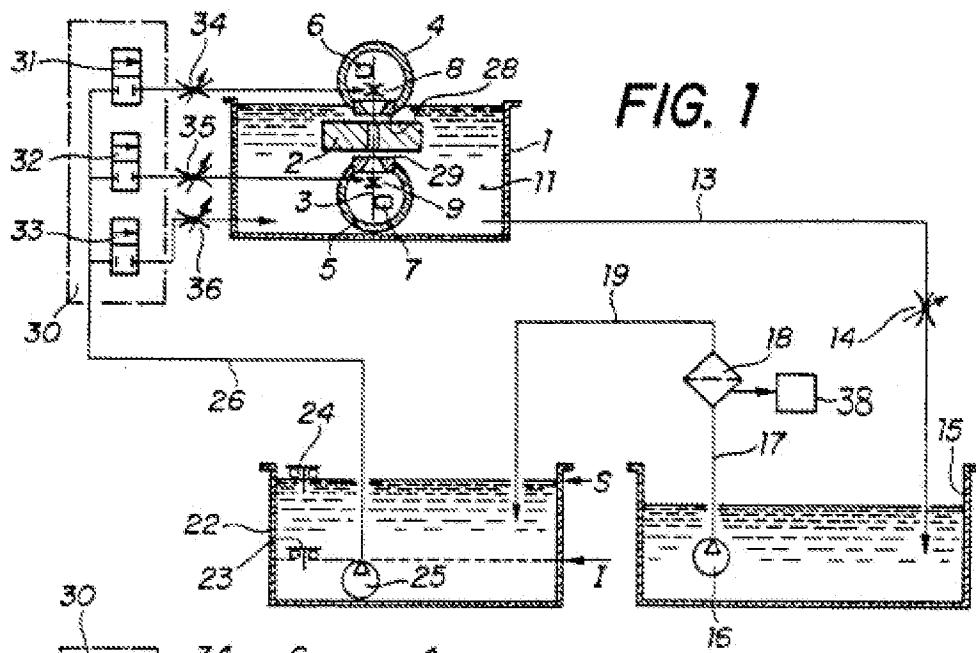
Independent Claims 1 and 13 specify, *inter alia*, a flushing and filtering system and method for an electroerosion machine comprising a first fluid return path comprising a high-pressure return path for introducing finely-filtered machining fluid through an electrode included in the electroerosion machine, and a second fluid return path for introducing finely-filtered machining fluid through a liquid adding inlet directly connected to the work tank. (Emphasis added).

By contrast, Suzuki discloses an EDM machine having a wire electrode 1 with a pair of nozzles 11, 12 at each thereof. *See Fig. 7(a)*. The nozzles provide machining solution into the inter-electrode gap between the electrode and the workpiece. *See col. 1, line 62-col. 2, line 18.*

FIG. 7(a)



23-33. Corcelle is silent as to the specific location where the dielectric fluid is provided to the wire electrode 3.



According to MPEP §2143, to establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Linter*, 458 F.2d 1013, 173 USPQ 560, 562 (CCPA 1972). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the applied reference must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Appellant respectfully submits that the applied art does not disclose, teach or suggest at least the feature of a first fluid return path comprising a high-pressure return path for introducing finely-filtered machining fluid through an electrode included in the electroerosion machine, as recited in Claims 1 and 13. Thus, the applied art does not teach or suggest all the claim limitations and the Examiner fails to establish a *prima facie* case of obviousness, so the rejection is unsupported by the art and should be reversed.

Further, there are significant system and operational differences between the electroerosion apparatus and process of the claimed invention and the cited prior art EDM

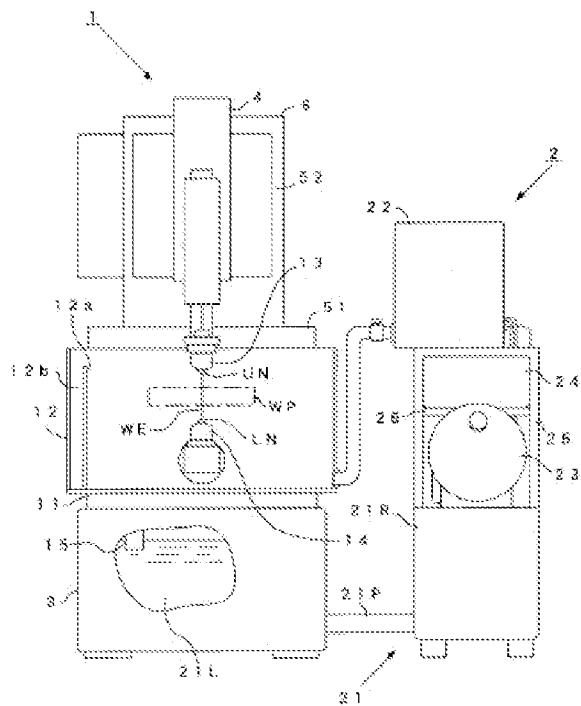
apparatus and process. In the electroerosion apparatus and process of the claimed invention, the electrode spins and feeds simultaneously. On the other hand, the wire in the prior art EDM process only travels linearly. Because of this significant difference, the electroerosion apparatus and process of the claimed invention uses internal flushing through the front surface of the electrode to wrap the fluid around the machining zone, while the prior art EDM process uses external flushing in the same direction of wire travel to remove chips outside the machining zone.

In view of the foregoing, a person of ordinary skill in the art having common sense at the time of the invention would not have reasonably considered passing filtered fluid through the electrode, as recited in the claimed invention.

2. Rejection of Claims 1, 3-13 and 15-24 under 35 U.S.C. §103(a) over Suzuki in view of Hosaka, and further in view of Corcell

Similar to Suzuki and Corcell, Hosaka discloses an EDM machine having a wire electrode WE and a guide assembly 13 with an upper nozzle UN for providing fluid towards the machining gap. See Fig. 1, col. 5, lines 51-56.

FIG. 1



Again, Appellant respectfully submits that the applied art does not disclose, teach or suggest at least the feature of a first fluid return path comprising a high-pressure return path for introducing finely-filtered machining fluid through an electrode included in the electroerosion machine, as recited in Claims 1 and 13. Thus, the applied art does not teach or suggest all the claim limitations and the Examiner fails to establish a *prima facie* case of obviousness, so the rejection is unsupported by the art and should be reversed.

In view of the foregoing, Appellant respectfully submits that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is earnestly solicited.

Dated: April 1, 2008

Respectfully submitted,

By /Peter J. Rashid/

Peter J. Rashid, Reg. No. 39464

VIII. CLAIMS APPENDIX

1. A flushing and filtering system for an electroerosion machine, comprising:
 - a work tank configured to maintain a workpiece therein;
 - a first filtering stage for roughly filtering residue-containing machining liquid exiting from said work tank;
 - a second filtering stage for finely filtering roughly-filtered machining liquid exiting from said first filtering stage;
 - a first fluid return path to said work tank, said first fluid return path comprising a high-pressure return path for introducing finely-filtered machining fluid through an electrode included in the electroerosion machine; and
 - a second fluid return path to said work tank, said second fluid return path introducing said finely-filtered machining fluid through a liquid adding inlet directly connected to said work tank.
3. The flushing and filtering system of claim 1, wherein said first filtering stage further comprises:
 - a rough filtering device for receiving residue-containing machining liquid exiting from said work tank;
 - a first filtering tank for holding said roughly-filtered machining liquid passed through said rough filtering device; and
 - a rough filtering pump for transferring said roughly-filtered machining liquid from said first filtering tank to said second filtering stage.

4. The flushing and filtering system of claim 3, wherein said second filtering stage further comprises:

a fine filtering device for receiving said roughly-filtered machining liquid transferred from said first filtering tank;

a fine filtering tank for holding said finely-filtered machining liquid passed through said fine filtering device;

a high-pressure pump for supplying said finely filtered machining liquid through said first fluid return path; and

a liquid-adding pump for supplying said finely filtered machining liquid through said second fluid return path.

5. The flushing and filtering system of claim 1, wherein said first fluid return path is further configured so as to provide said finely filtered machining liquid to a guide bush, said guide bush having an end of said electrode disposed therethrough.

6. The flushing and filtering system of claim 1, wherein a bottom surface of said work tank is sloped so as to cause said residue-containing machining liquid to run toward an outlet proximate the bottom of said work tank.

7. The flushing and filtering system of claim 1, wherein said machining liquid is a dielectric material.

8. The flushing and filtering system of claim 1, wherein said machining liquid is an electrolyte material.

9. The flushing and filtering system of claim 4, further comprising a pressure sensor within said first fluid return path.

10. The flushing and filtering system of claim 1, wherein said work tank is configured to keep said workpiece completely submerged within said machining fluid.

11. The flushing and filtering system of claim 5, wherein work tank is further configured to spray machining fluid on exterior surfaces of said guide bush and said workpiece.

12. The flushing and filtering system of claim 11, further comprising a nozzle configured for spraying machining fluid on said exterior surfaces of said guide bush and said workpiece, said nozzle included within said second fluid return path.

13. A method for flushing and filtering an electroerosion machine, comprising:

passing a residue-containing machining liquid through a first filtering stage for roughly filtering said residue-containing machining liquid, said residue-containing liquid exiting from a work tank configured to maintain a workpiece therein;

passing roughly-filtered machining liquid exiting from said first filtering stage into a second filtering stage for fine filtering of said roughly-filtered machining liquid;

returning finely-filtered machining fluid to said work tank through a first fluid return path, said first fluid return path comprising a high-pressure return path for introducing said finely-filtered machining fluid through an electrode included in the electroerosion machine; and

returning said finely-filtered machining fluid to said work tank through a second fluid return path, said second fluid return path introducing said finely-filtered machining fluid through a liquid adding inlet directly connected to said work tank.

15. The method of claim 13, wherein said first filtering stage further comprises:

a rough filtering device for receiving residue-containing machining liquid exiting from said work tank;

a first filtering tank for holding said roughly-filtered machining liquid passed through said rough filtering device; and

a rough filtering pump for transferring said roughly-filtered machining liquid from said first filtering tank to said second filtering stage.

16. The method of claim 15, wherein said second filtering stage further comprises:

a fine filtering device for receiving said roughly-filtered machining liquid transferred from said first filtering tank;

a fine filtering tank for holding said finely-filtered machining liquid passed through said fine filtering device;

a high-pressure pump for supplying said finely filtered machining liquid through said first fluid return path; and

a liquid-adding pump for supplying said finely filtered machining liquid through said second fluid return path.

17. The method of claim 13, wherein said first fluid return path is further configured so as to provide said finely filtered machining liquid to a guide bush, said guide bush having an end of said electrode disposed therethrough.

18. The method of claim 13, wherein a bottom surface of said work tank is sloped so as to cause said residue-containing machining liquid to run toward an outlet proximate the bottom of said work tank.

19. The method of claim 13, wherein the electroerosion machine includes a dielectric material passed through a gap between the tool electrode and workpiece.

20. The method of claim 13, wherein the electroerosion machine includes an electrolyte passed through a gap between the tool electrode and workpiece.

21. The method of claim 16, further comprising a pressure sensor within said first fluid return path.

22. The method of claim 13, wherein said work tank is configured to keep said workpiece completely submerged within said machining fluid.

23. The method of claim 13, wherein said work tank is further configured to spray machining fluid on exterior surfaces of said guide bush and said workpiece.

24. The method of claim 23, further comprising spraying said machining fluid on said exterior surfaces of said guide bush and said workpiece through a nozzle, said nozzle included within said second fluid return path.

IX. EVIDENCE APPENDIX

No evidence pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 is/are entered by the Examiner. Accordingly, no evidence is/are relied upon by the Appellant in this paper.

X. RELATED PROCEEDINGS APPENDIX

No related proceedings pursuant to 37 C.F.R. § 41.37(c)(1)(ii) is/are entered by, relied upon, or submitted by the Appellant with this paper.